Departmentar property

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES.

Minerals & Mining Program - Oil & Gas Section

Mest Main, Suite #1, Rapid City, SD 57702-2493

Telephonet 605-394-2229, FAX: 605-394-5317

RESOURCES - RAPID CITY

APPLICATION FOR PERMIT TO DRILL

Description of Spacing Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit East Laters Unit Unit well in East Harding Springs Red River Unit East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well in East Harding Springs Red River Unit Unit well In East Harding Springs Red River Unit Unit well In East Harding Springs Red River Unit Unit well In East Harding Springs Red River Unit Unit Well Name and Springs Red River Unit Unit Well Name And The River Unit Unit Well Name And The River Unit Unit Well Name And The River Unit Unit Well Name And Th	Type of Work				Type of Well:				
Name and Address of Surfixe Owner Millo & Barbara Downing, 12997 Cox Road, Ludlow, SD 57755 Name and Address of Surfixe Owner Millo & Barbara Downing, 12997 Cox Road, Ludlow, SD 57755 Name and Address of Drilling Contractor and Rig Number: Cyclone Rig # 11 S800 Molana Rd, Gillette, WY \$2718 Surface Location of Well (Pt-Qtr. Sec. Tsp., Rge. County, Feet from Nearest Lines of section, and latitude and longitude (if available): NWSE Sec. 30-T23N-RoE, Harding Co., 1710 FSL x 1880° FEL, Lat: 45° 55′ 33.318° N., Long: 103° 25′ 32.724° W If Directional, top of pay and bottom hole location from nearest lines of section: East Lateral: Top of pay end & 92.24 MD - 8951 'TVD (1735 'FSL x 1403 'FEL) HL - 2020 FSL & 1350° FEL Sec 29-T23N-RoE. Acres in Spacing (Drilling) Unit Unit well in East Harding Springs Red River Unit Well Name and Number EHSRRU J-3011 2985 'G: EHSRRU Harding Springs Red River Unit Well Name and Number EHSRRU J-3041 2985 'G: EHSRRU 1995 'G		Vell Reenter We	II Drill Dir	rectional Wel	Annual Control of the	Gas Well Inj	ection		
Name and Address of Surface Owner Milo & Barbara Downing, 12997 Cox Road, Ludlow, SD 57755 Name and Address of Drilling Contractor and Rig Number: Cyclene Rig # 11 5800 Mohan Rd, Gillette, WY 82718 Surface Location of Well: Groty, Sec, Tsp., Rge, County, Feet from Nearest Lines of section, and lutitude and longitude (if available): NWSE Sec 30-T23N-R6E, Harding Co., 1710' FSL x 1880' FEL, Lat: 45' 55' 33.318" N, Long: 103" 25' 32.724" W If Directional, top of pay and bottom hole location from nearest lines of section: East Lateral: Top of pay set #@ 9224' MD = 8951' TVD (1735' FSL x 1403' FEL) BHL = 2020' FSL & 1350' FEL Sec 29-123N-R6E Acres in Spacing (Drilling) Unit Unit well in East Harding Springs Red River Unit Well Name and Number Elsevation Field and Pool, or Wildcat Proposed Depth and Formation EHSRRU 7-30H Size of Hole Size of Clasing Weight per Foot Depth Cementing Program (amount, type, additives) Depth 13-1/2 19-5.8" 36-6 2006' KB None 23, 26, 299 9224' 100 sks Lite Tailed w: 500 sks Premium 4200' 4200' 455 sks Lite Tailed w: 500 sks Premium 4200' 4200' 456 sks Lite Tailed w: 500 sks Premium 4200' Lose Additional Page(s) if appropriate. Drill a medium radius horizontal well in the Red River "B" formation. Drill 13-1/2" surface hole to 2000' with fresh water. Run 9-5:8" casing and cement to surface. Drill 8-3-4" vertical hole to KOP at approximate 8472." Drill build section with an azimuth of approximately 873 (egrees and land in the top of the Red River "B" cone a 1924' MD = 895! TVD with a BHL 25' north and 47' cast of surface location vertice host of the horizontal and build sections to be drilled with invert oil mud. Run 7' casing and cement to 4200'. Drill on 6-1/8" horizontal lateral in the Red River "B" cone to approximately 873'. Prophene will be used for the horizontal section. All drilling fluids and cuttings will be contained in a pit lined with a 12 mil plastic liner. All liquids will be disposed of in an approved method, the liner and cuttings will be bu									
Name and Number Elevation Well Name and Number Elevation Elst RRU 1-30H Size of Hole Size of Hole Size of Casing Weight per Foot Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Use Additional Page(s) if appropriate. Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Mork). Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Drill a medium radius Incrizontal well in the Red River "B" formation. Drill 13-1/2" surface hole to 2000 with fresh water. Run 9-5/8" casing and cement to surface. Drill 8-3-4" vertical hole to KOP at approximate 8473. Drill build section with an azimuth of approximately 873 degrees and land in the top of the Red River "B" formation. Drill 13-1/2" surface hole to 2000 with fresh water. Run 9-5/8" casing and cement to surface. Drill 8-3-4" vertical hole to KOP at approximate 8473. Drill build section with an azimuth of approximately 873 degrees and land in the top of the Red River "B" contained by 67 degrees and land in the top of the Red River "B" contained by 67 degrees and land in the pop of the Red River "B" to the surface location. Nection with an azimuth of approximately 873 degrees and land in the pop of the Red River "B" contained by 67 degrees and land in the pop of the Red River "B" contained by 67 degrees and land in the pop of the Red R	LUFF EXPLORATION COMPANY, 1580 LINCOLN STREET, SUITE 850, DENVER, CO 80203 (303) 861-2468								
Cyclone Rig # 11 Surface Location of Well: Qtr-Qtr, Sec, Tsp., Rge, County, Feet from Nearest Lines of section, and latitude and longitude (if available): NWSE Sec 30-T23N-R6E, Harding Co., 1710 FSL x 1880 FEL, Lat 45' 55' 33.318" N, Long: 103" 25' 32.724" W If Directional, top of pay and bottom hole location from nearest lines of section: East Lateral: Top of pay set @ 92.24" MD = 8931' TVD (1735 FSL x 1403 FEL) BHL = 2020 FSL & 1350 FEL Sec 29-T23N-R6E Acres in Spacing (Drilling) Unit Unit well in East Harding Springs Red River Unit Well Name and Number Elsevation Field and Pool, or Wildcat Field an	The state of the s								
Surface Jocation of Well. Otr-Orr, Sec. Typ. Rge. County, Feet from Nearest Lines of section, and latitude and longitude (if available): NWSE Sec 30-T23N-R6E, Harding Co., 1710 FSL x 1880 FEL, Latt. 45° 55′ 33.318° N, Long. 103° 25′ 32.724° W If Directional, top of pay and bottom hole location from nearest lines of Section: East Lateral: Top of pay set @ 9224′ MD = 8951 TVD (1735 FSL x 1403 FEL) BHL = 2020 FSL & 1350 FEL Sec 29-T23N-R6E Acres in Spacing (Drilling) Unit Unit well in East Harding Springs Red River Unit East Harding Springs Red River Unit Well Name and Number EHSRRU J-30H 2981 Gr 2966′ KB EHSRRU J-30H 2966′ KB Size of Hole Size of Casing Weight per Foot 2966′ KB Size of Mole Size of Casing Weight per Foot 2966′ KB Size of Mole Size of Casing Weight per Foot 29, 8-34 7° 23, 26, 299 9224′ 100 sks Lite Tailed w 2000 sks Premium Surface 4) Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Use Additional Page(s) if appropriate. Drill a medium radius horizontal well in the Red River "B" formation. Drill 13-1/2" surface hole to 2000′ with fresh water. Run 9-5/8″ casing and cement to surface. Drill 8-3/4" vertical hole to KOP at approximate 8473. Drill build section with an azimuth of approximately 87 degrees and land in the top of the Red River "B" open at 924 MD = 8951 TVD at BHL 35° north and 477 cast of surface location. Vertical and build sections to be drilled with invert oil mud. Run 7° casing and cement to 4200′. Drill one 6-1/8" horizontal lateral in the Red River "B" zone to approximately 14565′ MD = 8951 TVD at BHL 36° north and 477 cast of surface location. Vertical and build sections to be drilled with invert oil mud. Run 7° casing and cement to 4200′. Drill one 6-1/8" horizontal lateral in the Red River "B" zone to approximately 14565′ MD = 8951 TVD at BHL 36° north and 477 cast of surface hole to drilling is 6/1/12. Enter Manuel Manuel Manuel Manuel Manuel Man	Cyclone Rig # 11								
East Lateral: Top of pay est @ 9224' MD = 8951' TVD (1735 FSL x 1403' FEL) BHIL = 2020' FSL & 1350' FEL Sec 29-T23N-R6E Acres in Spacing (Drilling) Unit Unit well in East Harding Springs Red River Unit Well Name and Number Elevation EHSRRU Jest in Field and Pool, or Wildcat Proposed Depth and Formation EHSRRU J [14,565' MD, 8951' TVD Red River B Size of Hole Size of Gasing Weight per Foot Depth 1) 13-1/2 9-5/8" 369 2000' 435 sks Lite Tailed w 2006' Sks Premium Surface 2) 8-3/4 7" 23, 26, 29% 9224' 100 sks Lite Tailed w 506 sks Premium Surface 4) Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Uses Additional Page(s) if appropriate. Drill a medium radius horizontal well in the Red River "B" formation. Drill 13-1/2" surface hole to 2000' with fresh water. Run 9-5/8" casing and cement to surface. Drill 8-3/4" vertical hole to KOP at approximate 8473'. Drill build section with an azimuth of approximately 87 degrees and land in the top of the Red River "B" zone at 9224' MD = 8951' TVD with a BHL 25' north and 477' cast of surface location. Vertical and build sections to be drilled with invert oil mad. Run "C assing and cement to 5000' build section with an azimuth of approximately 14565' MD = 8951' TVD at BHL approximately 2020' FSL and 1350' FEL Sec 29-T23N-R6E. Fresh water/polymer will be used for the horizontal section. All drilling fluids and cuttings will be contained in a pit lined with a 12 mil plastic liner. All liquids will be disposed of in an approved method, the liner and cuttings will be buried in place. The estimated start date for location construction is 5/15/12. Estimated start date for drilling is 6/1/12. FOR OFFICE USE ONLY Approved by: Permit No. 2010 API No. 40 063 20733 Date Issued: \$\frac{5}{2} \frac{1}{2} \frac	Surface Location of Well: Qtr-Qtr, Sec, Twp, Rge, County, Feet from Nearest Lines of section, and latitude and longitude (if available):								
Acres in Spacing (Drilling) Unit Unit well in East Harding Springs Red River Unit Well Name and Number Elevation EHSRRU 1-30H 2951' Gr EHSRRU 1-30H 2966' KB Size of Hole Size of Casing Weight per Foot 1) 13-1/2 29.5/8" 3666' 2000' 135-8/8" 3676 2000' 435-8/8 Lie Tailed w/ 200-8/8 Premium Surface 2) 8-3/4 7' 23, 26, 299 14565' 4) Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Uses Additional Page(s) if appropriate. Drill a medium radius horizontal well in the Red River "B" formation. Drill 13-1/2" surface hole to 2000' with fresh water. Run 9-5/8" casing and cement to surface. Drill 8-3/4" vertical hole to KOP at approximate 8473'. Drill build section with an azimuth of approximately 87 degrees and land in the top of the Red River "B" zone at 9224' MD = 8951' TVD with a BHL 25' north and 477' cast of surface location. Vertical and build sections to be drilled with invert oil mud. Run 7" casing and cement to 4200'. Drill one 6-1/8" horizontal lateral in the vert oil mud. Run 7" casing and cement to 4200'. Drill one 6-1/8" horizontal lateral in the 9851' TVD at BHL approximately 2020' FSL and 1350' FEL Sec 29-T23N-R6E. Fresh water/polymer will be used for the horizontal section. All drilling fluids and cuttings will be contained in a pit lined with a 12 mil plastic liner. All liquids will be disposed of in an approved method, the liner and cuttings will be buried in place. The estimated start date for location construction is \$/15/12. Estimated start date for drilling is 6/1/12. Permit No. 2010 API No. 40 063 20733 Date Issued: \$/1/2012 Title: Administrator. Mistrator. Mistrator. API No. 40 063 20733 Date Issued: \$/1/2012	East Lateral: Top of pay est @ 9224' MD = 8951' TVD (1735' FSL x 1403' FEL)								
Well Name and Number Elevation Field and Pool, or Wildcat Proposed Depth and Formation EHSRRU J-30H 2951' Gr EHSRRU 2966' KB Size of Hole Size of Hole Size of Gasing Weight per Foot 2060' KB Size of Hole Size of Size of Casing Weight per Foot 2000' 435 sks Lite Tailed w/ 200 sks Premium Surface 2) 8-3/4 7" 23, 26, 29# 9224' 1400 sks Lite Tailed w/ 500 sks Premium Surface 1) 4505' 100 sks Lite Tailed w/ 500 sks Premium Surface 1) 4200' 4200' Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Use Additional Page(s) if appropriate. Drill a medium radius horizontal well in the Red River "B" formation. Drill 13-1/2" surface hole to 2000' with fresh water. Run 9-5/8" casing and cement to surface. Drill 8-3/4" vertical hole to KOP at approximate 8473'. Drill build section with an azimuth of approximately 87 degrees and land in the top of the Red River "B" zone at 9224' MD = 895! TVD with a BHL. 25 north and 47' cast of surface land build sections to be drilled with invert oil mud. Run 7" casing and cement to 4200'. Drill one 6-1/8" horizontal lateral in the Red River "B" zone to approximately 14565' MD = 895! TVD at BHI. approximately 2020 FSL and 1350 FEL Sec 29-T23N-R6E. Fresh water/polymer will be used for the horizontal section. All drilling Hidds and cuttings will be contained in a pit lined with a 12 mill plastic liner. All liquids will be disposed of in an approved method, the liner and cuttings will be buried in place. The estimated start date for location construction is 5/15/12. Estimated start date for drilling is 6/1/12. FOR OFFICE USE ONLY Approved by: Aproved by:									
EHSRRU J-30H 295 **Gr EHSRRU 14,565* MD, 8951* TVD Red River B 14,565* MD, 8951* TVD Red River B 13-1/2 9-5,88** 36# 2000** 435** sks. Lite Tailed w/ 200 sks Premium Surface 2) 8-3/4 7* 23, 26, 29# 9224** 100 sks. Lite Tailed w/ 500 sks Premium 4200** 435** sks. Lite Tailed w/ 500 sks Premium 4200** 436** sks. Lite Tailed w/ 500 sks Premium 4200** 436** sks. Lite Tailed w/ 500 sks Premium 4200** 436** sks. Lite Tailed w/ 500 sks Premium 4200** 436** sks. Lite Tailed w/ 500 sks Premium 4200** 436** sks. Lite Tailed w/ 500 sks Premium 4200** 436** sks. Lite Tailed w/ 500 sks Premium 4200** sks. Additional Page(s) if appropriate. Drill a medium radius horizontal well in the Red River "B" formation. Drill 13-1/2" surface hole to 2000** with fresh water. Run 9-5/8" casing and cement to surface. Drill 8-3/4" vertical hole to KOP at approximate 8473*. Drill build section with an azimuth of approximately 87 degrees and land in the top of the Red River "B" zone at 9224* MD = 8951* TVD with a BHL 25* north and 477* cast of surface location. Vertical and build sections to be drilled with invert oil mud. Run 7" casing and cement to 4200*. Drill one 6-1/8" horizontal lateral in the Red River "B" zone to approximately 145.5** MD = 8951* TVD at BHL approximately 2020* FSL and 1350* FEL Sec 29-T23N-R6E. Fresh water/polymer will be used for the horizontal section. All drilling fluids and cuttings will be contained in a pit lined with a 12 mil plastic liner. All liquids will be disposed of in an approved method, the liner and cuttings will be buried in place. The estimated start date for location construction is \$/15/12. Estimated start date for drilling is 6/1/12. Permit No. 2010 API No. 40 063 20733 Date Issued: \$5/1/2012									
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2) 8-3/4 3) 6-1/8 None 23, 26, 29# 224' 14565' 100 sks Lite Tailed w/ 500 sks Premium 4200' 4200	Size of Hole	Size of Casing		Depth	Cementing Program		Depth		
Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Use Additional Page(s) if appropriate. Drill a medium radius horizontal well in the Red River "B" formation. Drill 13-1/2" surface hole to 2000' with fresh water. Run 9-5/8" casing and cement to surface. Drill 8-3/4" vertical hole to KOP at approximate 8473'. Drill build section with an azimuth of approximately 87 degrees and land in the top of the Red River "B" zone at 9224' MD = 8951' TVD with a BHL 25' north and 477' cast of surface location. Vertical and build sections to be drilled with invert oil mud. Run 7" casing and cement to 4200'. Drill one 6-1/8" horizontal lateral in the Red River "B" zone to approximately 14565' MD = 8951' TVD at BHL approximately 2020' FSL and 1350' FEL Sec 29-T23N-R6E. Fresh water/polymer will be used for the horizontal section. All drilling fluids and cuttings will be contained in a pit lined with a 12 mil plastic liner. All liquids will be disposed of in an approved method, the liner and cuttings will be buried in place. The estimated start date for location construction is 5/15/12. Estimated start date for drilling is 6/1/12. Thereby certify that the foregoing as to an work or operation performed is a true and correct report of such work or operation. Richard D. George Manager of Engineering 4/20/2012 Signature Name (Print) Title Date FOR OFFICE USE ONLY Approved by: Only Title: Administrator Manules' Musy Prg. Permit No. 2010 API No. 40 063 20733 Date Issued: 5/1/2012				2000'	435 sks Lite Tailed w/ 200 sks Premium Surface				
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the top of the Red River "B" zone at 9224' MD = 8951' TVD with a BHL 25' north and 477' east of surface location. Vertical and build sections to be drilled with invert oil mud. Run 7" casing and cement to 4200'. Drill one 6-1/8" horizontal lateral in the Red River "B" zone to approximately 14565' MD = 8951' TVD at BHL approximately 2020' FSL and 1350' FEL Sec 29-T23N-R6E. Fresh water/polymer will be used for the horizontal section. All drilling fluids and cuttings will be contained in a pit lined with a 12 mil plastic liner. All liquids will be disposed of in an approved method, the liner and cuttings will be buried in place. The estimated start date for location construction is 5/15/12. Estimated start date for drilling is 6/1/12. Thereby certify that the foregoing as to say work or operation performed is a true and correct report of such work or operation. Richard D. George Manager of Engineering 4/20/2012 Signature Name (Print) Title Date FOR OFFICE USE ONLY Approved by:									
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DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

Minerals & Mining Program 2050 West Main Street, Suite #1 Rapid City, SD 57702-2493 Telephone: 605-394-2229

Fax: 605-394-5317

PERMIT CONDITIONS

Luff: J-30H EHSRRU 23N-6E-30 NWSE, Harding County

Permit: #2010 API: 40 063 20733

Approval has been granted to drill this location as detailed on the attached Application for Permit to Drill (Form #2) with the following additional conditions:

- 1. This permit is conditioned on compliance with all applicable requirements of South Dakota Codified Laws 45-9 and Administrative Rules of South Dakota 74-12.
- 2. A 12-mil woven, reinforced high-density polyethylene liner must be used on all pits.
- 3. Surface runoff must be diverted around the drill site.
- 4. The surface hole must be drilled with fresh water.
- 5. Cement must be circulated to the ground surface on the surface casing.
- 6. If horizontally drilled:
 - A. The coordinates of the production casing shoe and the well terminus must be filed with the department.
 - B. The azimuth of the horizontal segment of the well must be filed with the department along with the results of periodic down hole surveys.
- 7. If production casing (long string) is set:
 - A. Sufficient cement must be circulated on the long string to cover any fresh water aquifer not covered by the surface casing. Freshwater resources not covered at this site include: Madison, Minnelusa, Minnekahta, Canyon Springs, and Inyan Kara.
 - B. A cement bond log must be run and filed with the department.
- 8. If abandoned:
 - A. With long string, sufficient cement must be circulated to install:
 - 1. A 100-foot cement plug immediately above the KOP, if horizontally drilled.
 - 2. A 100-foot cement plug, half in and half out of the top of the casing stub after the retrievable part of the production casing has been removed.
 - 3. A 100-foot cement plug, half in and half out of the top of any fresh water aquifer between the top of the casing stub and the base of the surface casing. Freshwater resources at this site include: Madison, Minnelusa, Minnekahta, Canyon Springs, and Inyan Kara.
 - 4. A 100-foot plug, half in and half out of the base of the surface casing.
 - 5. A 25-foot cement plug at the top of the surface casing.
 - B. Without long string, sufficient cement must be circulated to set:
 - 1. A 100-foot cement plug immediately above the KOP, if horizontally drilled.
 - 2. 100-foot cement plugs, half in and half out of the top of the following formations: Red River, Interlake, Madison, Minnelusa, Minnekahta, Canyon Springs, and Inyan Kara.
 - 3. A 100-foot cement plug, half in and half out of the base of the surface casing.
 - 4. A 25-foot cement plug at the top of the surface casing.
 - C. Heavy, mud-laden fluid must be used between all plugs.
 - D. The casing string must be cut off at least three feet below the final ground surface contour. A plate with the name of the operator, well name and number, and legal location by quarter-quarter section, township and range must be welded to the casing stub. The location of the abandoned well must be surveyed with high resolution global positioning system equipment or other appropriate survey methods sufficient to accurately locate the well. Survey coordinates must be included in the final abandonment report.

- 9. Surface reclamation of the site must be completed within one year of plugging and abandoning the well.
- 10. A washed set of sample cuttings (or cores, if cut) must be shipped, free of charge, to:

Derric Iles Geological Survey Program Akeley-Lawrence Science Center University of South Dakota 414 E. Clark Street Vermillion, SD 57069-2390

11. Please notify this office prior to plugging so a witness can be on location. If plugging will occur after regular business hours, call Lucy Dahl at 605-773-6257.